

**NOMENCLATURAL NOTE*****Liturgusa* Saussure, 1869 (Insecta, Mantodea, LITURGUSIDAE):  
conservation as a justified emendation**

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**Abstract.** The Mantodea genus name *Liturgusa* Saussure, 1869 was originally published as *Liturgousa* but the spelling of *Liturgusa* (an unjustified emendation) has been in prevailing usage since 1900 and as such is deemed available under Article 33.2.3.1 of the Code.

**Keywords.** Nomenclature; taxonomy; Mantodea; LITURGUSIDAE; *Liturgusa*; *Liturgousa*; *Liturgousa cayennensis*; praying mantis; Neotropical.

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1. *Liturgousa* was described by Henri de Saussure in 1869 (p. 62) to include two species, *Mantis annulipes* Audinet Serville, 1838 (p. 199) and his newly described *Liturgousa cayennensis* Saussure, 1869 (p. 62). The genus name is derived from the Greek ‘Liturgus’ (feminine form ‘Liturga’), meaning ‘celebrator of liturgy’, which indicates that Saussure’s correct original spelling of *Liturgousa* may have been a mistake, but under Article 32.5.1 of the Code ‘incorrect transliteration or latinization, or use of an inappropriate connecting vowel, are not to be considered inadvertent errors’ and thus is not demonstrably incorrect under Article 32.5 and stands as the correct original spelling under Article 32.2 of the Code.

2. *Liturgusa*, first used by Carl Stål (1877, pp. 3, 40) was attributed to the original author, Saussure (1869) and appears to be an emendation. However, since this emendation is applied to a correct original spelling and he also did not include a justification for his subsequent spelling (Article 33.2.1), it is considered as an unjustified emendation under Article 33.2.3 of the Code. Stål did cite the correct original spelling in his 1877 (p. 50) work, giving evidence that he was attempting an emendation to correct Saussure’s incorrect latinization.

3. The two included species upon the establishment of the genus *Liturgousa* Saussure, 1869 were *Mantis annulipes* Audinet Serville, 1838 and *Liturgousa cayennensis* Saussure, 1869, but neither was designated as the type species. No type was established until subsequent designation, adherent to Article 69.1 of the Code, by Kirby (1904, p. 271) of *Liturgousa cayennensis* Saussure, 1869, which was valid under Article 67.2 of the Code as this species was an ‘originally included nominal species’ available for fixation. However, Giglio-Tos (1927, p. 292) took subsequent action by designation of *Mantis annulipes* Audinet Serville, 1838, an act not valid according to Article 69.1.2 of the Code, which states that the first designation in a publication is to be accepted, which is Kirby (1904, p. 271). This type discrepancy was first recognized by Rehn (1935, p. 198) having stated in footnote ‘Giglio-Tos (Das

Tierreich, Lief. 50, p. 292, (1927)), erroneously gives *annulipes* as the genotype. Kirby's fixation is the first, and, being made on one of the two originally included species, must be followed.' Unfortunately, recognition of *Liturgousa cayennensis* Saussure, 1869 as the type for the genus has not been uniform across taxonomic works (e.g. Ehrmann, 2002, p. 206 recognizes *Mantis annulipes* and Otte & Spearman, 2005 (p. 132) recognize *Liturgousa cayennensis*).

4. Both spellings of the generic name have been used in new species binomials before 1899 and after, as well as in recent times. Subsequent to the original genus description, Saussure (1872, p. 53) added an additional species under the binomen *Liturgousa surinamensis*. Three species were described, *Liturgousa lichenalis*, *Liturgousa superba* and *Liturgousa nubeculosa* by Gerstaecker (1889, pp. 52–56) using Stål's spelling. John Obadiah Westwood (1889, p. 30) described *Liturgousa mesopoda* using the correct original spelling. The publication by Westwood came slightly after that of Gerstaecker's and included *Mantis annulipes*, *Liturgousa cayennensis*, *Liturgousa lichenalis*, *Liturgousa nubeculosa* and his own new species *Liturgousa mesopoda*. The next species, *Liturgousa maya*, was described by Saussure & Zehntner (1894, p. 160) only as a variant of *Liturgousa cayennensis*. Kirby (1904, p. 271) included six species within *Liturgousa*, *Liturgousa annulipes*, *Liturgousa lichenalis*, *Liturgousa cayennensis*, *Liturgousa maya*, *Liturgousa mesopoda* and *Liturgousa malagassa*. Kirby also included *Liturgousa nubeculosa*, *Liturgousa superba* and *Liturgousa surinamensis* within *Hagiomantis* without providing a justification for the move. Giglio-Tos (1914, pp. 77–78) described *Liturgousa peruviana* from Peru and *Liturgousa parva* from Brazil. Max Beier (1931, p. 14) described *Liturgousa atricoxata*. Then, Beier (1935, p. 11) provided a description of the genus as well as a list of nine species of *Liturgousa* that included *Liturgousa peruviana*, *Liturgousa cayennensis*, *Liturgousa maya*, *Liturgousa charpentieri*, *Liturgousa atricoxata*, *Liturgousa mesopoda*, *Liturgousa nubeculosa*, *Liturgousa annulipes* and *Liturgousa parva*. La Greca (1939, p. 2–5) described in detail the highly distinct species *Liturgousa guyanensis*. Rehn (1950) described two new species from Central America, *Liturgousa cursor* (1950, p. 369) and *Liturgousa actuosa* (1950, p. 377). Piza (1982, p. 94) described *Liturgousa sinvalnetoi* from Piracicaba, Brazil.

5. Only one publication cited the action of Stål as an emendation, but it did not label his action as unjustified (Roy & Cuche, 2008). In addition, four works consider Saussure's correct original spelling of *Liturgousa* as an error of transcription (see 1. above; Ehrmann, 2002; Giglio-Tos, 1927; Jantsch, 1999; Terra, 1995). Two works consider *Liturgousa* simply as a synonym of *Liturgousa* (Agudelo et al., 2007; Otte & Spearman, 2005).

6. Subsequent to Stål's first use of *Liturgousa* in 1877, the spelling has been used in only 18 works previous to 1963 by 11 authors. However, use of Stål's spelling is now dominant in the recent literature and reverting to using *Liturgousa* would threaten taxonomic stability. Under Article 33.2.3.1 the unjustified emendation (*Liturgousa*) becomes justified when it is in prevailing usage and is attributed to the original author and date. Clearly demonstrating prevailing usage as outlined in Article 23.9.1.2, thirty three works have been identified (at least 25 are required) using *Liturgousa* in the previous 50 years that are by at least 10 authors (27 authors identified), p. Beier, 1964, p. 943; Weidner, 1964, p. 143; Beier, 1968, pp. 8, 14, 32; Marshall, 1975, p. 322; Bazyluk, 1977, pp. 133, 169; Passerin d'Entrèves, 1981, p. 61; Piza, 1982, p. 94; Jantsch, 1991, p. 125; Terra, 1995, pp. 53–54, figs. 85–87; Salazar E., 1998, p. 105,

Fig. 4; Edmunds & Brunner, 1999, p. 282; Jantsch, 1999, p. 19, 24, 30–31, 33, 35, 39, 47, Tables 4–6; Roy, 1999, p. 30; Salazar E., 1999, p. 10; Maes & Roy, 2000, p. 61; Salazar E., 2000, p. 67; Lombardo & Agabiti, 2001, p. 90, 96–97; Salazar E., 2002, p. 121, 124; Ehrmann, 2002, p. 26, 33, 206, 375; Agudelo & Chica, 2002, pp. 7, 20, 30, 36, 62, Fig. 8b; Agudelo & Chica, 2003, p. 127, 130, 131, 132, 133, Tables 1, 3, figs. 1, 3, 7; Agudelo, 2004, pp. 44, 55, Table 3.1; Salazar E., 2004, pp. 211, 213; Agudelo, 2005, p. 3; Otte & Spearman, 2005, pp. 132, 481; Agudelo et al., 2007, pp. 109, 116, 141; Medellín et al., 2007, p. 151; Roy & Cuche, 2008, pp. 8, 14, 21; Yager & Svenson, 2008, pp. 556, 565; Wieland, 2008, p. 158; Svenson & Whiting, 2009, p. 503; Wieland, 2013, pp. 22, 57, 87, 89, 130, 154, 158, 176, figs. 2, 4A, 20–21; Svenson, 2014. However, a number of works use the correct original spelling of *Liturgousa* Saussure, 1869 after 1899; Scudder, 1901, pp. 159, 407, 419; Waterhouse, 1902, p. 202; Rehn, 1903, p. 6; Kirby, 1904, p. 271; Bruner, 1906, p. 143; Werner, 1906, p. 372; Werner, 1908, p. 39; Werner, 1909, p. 77–78; Chopard, 1911, p. 323; Carl, 1914, p. 148; Chopard, 1916, p. 164; Werner, 1916, p. 257, 274; Caudell, 1918, p. 5; Hebard, 1919a, p. 31; Hebard, 1919b, p. 134; Hebard, 1924, p. 131; Hebard, 1929, p. 399; Hebard, 1932, p. 211; Hebard, 1933, p. 29; Rehn, 1935, p. 172, 198–199, 201, 203–204, pl. 8, figs. 4–5; Hesse, 1937, p. 108, 578; Tinkham, 1937, p. 490–491; Hughes-Schrader, 1943, p. 266, 280, 282–283, 290, 294, 296–297, Table 1, figs. 19–28; Hughes-Schrader, 1948, p. 267; Rehn, 1950, pp. 369, 377; Hughes-Schrader, 1950, pp. 10–11, 13–14, 27, 38–39, 44–45, Table 1, figs. 9–11; Hughes-Schrader, 1951, pp. 178–181, 183–184, 186–187, Table 1–2, figs. 1–3; Beebe et al., 1952, pp. 245–247, Fig. 2; Crane, 1952, p. 259, 264, figs. 2, 3; Hughes-Schrader, 1953, pp. 544–554; Rehn, 1954, pp. 177, 179; Schrader & Hughes-Schrader, 1956, pp. 493–494, 496; Callan & Jacobs, 1957, p. 201; Krombein, 1963, p. 2; Henderson, 1965, pp. 206, 215; White, 1965, p. 542; Otte, 1978, p. 76; Cerdá, 1996, pp. 75–76. Of the 38 located works using the correct original spelling of *Liturgousa* after 1899, only five (two of which are non-taxonomic) were in the past 50 years, 21 authors total (Rehn, Hebard and the Hughes-Schrader group were dominant users [45% of works], all of whom were close collaborators), and 87% of the works were published before 1960. Therefore, use of the correct original spelling after 1899 did occur, but was primarily in the first half of the 1900s.

7. Svenson (2014) conducted a comprehensive revision of *Liturgousa* and used the subsequent spelling, *Liturgusa* Saussure, 1869. This work treated all described species of *Liturgousa*, described 19 new species, identified four synonymies, moved one species from *Liturgousa* to *Hagiomantis* and created three new genera (*Fuga*, *Velox* and *Cortimantis*) for species previously included in *Liturgousa* as well as *Hagiomantis*. This study adds considerable weight to the prevailing usage of the subsequent spelling.

8. Therefore, the unjustified emendation *Liturgousa* is in prevailing usage and as such is deemed to be available as a justified emendation attributed to the original author under Article 33.2.3.1 of the Code.

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## References

- Agudelo R., A.A.** 2004. Mántidos de Colombia (Dictyoptera: Mantodea) in Fernández, C., Gonzalo Andrade-C F., M. & Amat G., G.D. (Eds.), *Insectos de Colombia*. 602 pp. Universidad Nacional, Facultad de Ciencias, Bogota.
- Agudelo R., A.A.** 2005. Relatorio de identificacao da colecao de Louva-a deus (Insecta, Mantodea) do Instituto Nacional de Pesquisas da Amazonia. 5 pp. INPA.
- Agudelo R., A.A. & Chica E., L.M.** 2002. Mantidos. Introduccion al conocimiento del orden Mantodea. *Universidad Distrital Francisco Jose de Caldas, Centro de Investigaciones y Desarrollo Científico*, VII-XVI: 1–74.
- Agudelo R., A.A. & Chica E., L.M.** 2003. Mántidos de la Orinoquia Colombiana: contribución al conocimiento de su diversidad genérica y algunos aspectos bioecológicos (Insecta: Mantodea). *Revista Colombiana de Entomología*, 29(2): 127–136.
- Agudelo Rondón, A.A., Lombardo, F. & Jantsch, L.J.** 2007. Checklist of the Neotropical mantids (Insecta, Dictyoptera, Mantodea). *Biota Colombiana*, 8(2): 105–158.
- Audinet Serville, J.G.** 1838. *Histoire naturelle des insectes orthoptères*. 776 pp. Roret, Paris.
- Bazyluk, W.** 1977. Blattodea et Mantodea (Insecta). *Polska Akademia Nauk*, 6: 1–175.
- Beebe, W., Crane, J. & Hughes-Schrader, S.** 1952. An annotated list of the Mantids (Orthoptera, Mantoidea) of Trinidad, B.W.I. *Zoologica: New York Zoological Society*, 37(4): 245–258.
- Beier, M.** 1931. Neue und seltene Mantodeen aus dem Zoologischen Staatsinstitut und Zoologischen Museum Hamburg. *Mitteilungen au dem Zoologischen Staatsinstitut und Zoologischen Museum in Hamburg*, 45: 1–21.
- Beier, M.** 1935. Mantodea, Fam. Mantidae, Subfam. Mantinae in: *Genera Insectorum de P. Wytsman*, 203 Fascicule. 154 pp. Louis Desmet-Verteneuil, Bruxelles.
- Beier, M.** 1964. Blattopteroidea-Mantodea. Pp. 850–970 in Bronn, H.G., *H.G. Bronns Klassen und Ordnungen des Tierreichs. III. Abt.: Insecta-Arthropoda.*, vol. 5, part 6. Akademische Verlagsgesellschaft, Leipzig.
- Beier, M.** 1968. Mantodea. Pp. 1–47 in Helmcke, J.G., Starck, D. & Wermuth, H. *Handbuch der Zoologie*. 12, Teil 2/12, 4(2). Walter de Gruyter & Co., Berlin.
- Bruner, L.** 1906. Report on the Orthoptera of Trinidad, West-Indies. *Journal of the New York Entomological Society*, 14(3): 135–168.
- Callan, H.G. & Jacobs, P.A.** 1957. The meiotic process in *Mantis religiosa* L. males. *Journal of Genetics*, 55(1): 200–217.
- Carl, J.** 1914. Orthoptères de Madagascar (Planéoptérides et Pseudophyllides). I. Considérations zoogéographiques. *Revue Suisse de Zoologie*, 22(6): 147–177.
- Caudell, A.** 1918. On a collection of Orthoptera (Exclusive of the Locustidae) made in Central Peru by N. Iconnicoff and C. Schunke, C. *Insecutor Inscitiae Menstruus*, 6(1–3): 1–70.
- Cerdá, F.J.** 1996. Mantodea de Venezuela. Generos y lista preliminar de especies Parte II: Familia Mantidae (Subfamilias Liturgousinae y Thespinae). *Boletín de Entomología Venezolana*, 11(2): 73–87.
- Chopard, L.** 1911. Contribution de la faune des Orthoptères de la Guyane française. *Annales de la Société Entomologique de France*, 80: 315–350.
- Chopard, L.** 1916. Étude des Mantides Américains. Collection I. Bolivar. *Annales de la Société Entomologique de France*, 85: 161–187.
- Crane, J.** 1952. A comparative study of innate defensive behavior in Trinidad mantids (Orthoptera, Mantoidea). *Zoologica: New York Zoological Society*, 37(931): 259–293.
- Edmunds, M. & Brunner, D.** 1999. Ethology of defense against predators. Pp. 276–299 in Prete, F.R., Wells, H., Wells, P.H. & Hurd, L.E. (Eds.), *The praying mantids*. 362 pp. The Johns Hopkins University Press, Baltimore.
- Ehrmann, R.** 2002. *Mantodea: Gottesanbeterinnen der Welt*. 519 pp. Natur und Tier – Verlag GmbH, Münster.

- Gerstaecker, A.** 1889. Charakteristik einer Reihe bemerkenswerther Orthopteren. *Mittheilung aus dem Naturwissenschaftlichen Verein Für Neu-Vorpommern und Rügen in Greifswald*, **20**: 43–100.
- Giglio-Tos, E.** 1914. Mantidi esotici. Generi e specie nuove. *Bollettino della Societa Entomologica Italiana*, **46**: 31–108.
- Giglio-Tos, E.** 1927. Mantidae. In *Das Tierreich*, Lief. 50. 707 pp. Walter de Gruyter & Co., Berlin.
- Hebard, M.** 1919a. The Blattidae of Panama. *Memoirs of the American Entomological Society*, **4**: 1–148.
- Hebard, M.** 1919b. Studies in the Dermaptera and Orthoptera of Colombia. First paper. Dermaptera and orthopterous families Blattidae, Mantidae and Phasmidae. *Transactions of the American Entomological Society*, **45**(2): 89–179.
- Hebard, M.** 1924. Studies in the Dermaptera and Orthoptera of Ecuador. *Proceedings of the Academy of Natural Sciences of Philadelphia*, **76**: 109–248.
- Hebard, M.** 1929. Supplementary notes on Panamanian Dermaptera and Orthoptera. *Transactions of the American Entomological Society*, **55**(4): 389–400.
- Hebard, M.** 1932. New species and records of Mexican Orthoptera. *Transactions of the American Entomological Society*, **58**: 201–371.
- Hebard, M.** 1933. Studies in the Dermaptera and Orthoptera of Colombia. Supplement to papers one to five. *Transactions of the American Entomological Society*, **59**(1): 13–67.
- Henderson, S.A.** 1965. Chromosome behaviour in diploid and tetraploid cells of *Sphodromantis gastrica* and its bearing on chromosome evolution in the mantids. *Chromosoma*, **16**: 192–221.
- Hesse, R.** 1937. *Ecological animal geography*. 597 pp. John Wiley & Sons, Inc., New York.
- Hughes-Schrader, S.** 1943. Polarization, kinetochore movements, and bivalent structure in the meiosis of male mantids. *The Biological Bulletin*, **84**: 265–300.
- Hughes-Schrader, S.** 1948. Expulsion of the sex chromosome from the spindle in spermatocytes of a mantid. *Chromosoma*, **3**(4): 257–270.
- Hughes-Schrader, S.** 1950. The chromosomes of mantids (Orthoptera: Manteidae) in relation to taxonomy. *Chromosoma*, **4**: 1–55.
- Hughes-Schrader, S.** 1951. The desoxyribonucleic acid content of the nucleus as a cytotoxic character in mantids (Orthoptera: Mantoidea). *Chromosoma*, **10**: 178–187.
- Hughes-Schrader, S.** 1953. The nuclear content of desoxyribonucleic acid and interspecific relationships in the mantid genus *Liturgousa* (Orthoptera: Mantoidea). *Chromosoma*, **5**: 544–554.
- Jantsch, L.J.** 1991. Lista dos Mantódeos coletados na Ilha de Maracá. *Acta Amazonica*, **21**: 123–130.
- Jantsch, L.J.** 1999. *Estudos filogene'ticos em Manto'deos americanos (Insecta: Pterygota: Mantodea)*. 138 pp. PUCRS, Doutorado, Porto Alegre.
- Kirby, W.F.** 1904. *A synonymic catalogue of Orthoptera. I. Orthoptera Euplexoptera, Cursoria et Gressoria*, vol. 1. 501 pp. British Museum, Natural History, London.
- Krombein, K.V.** 1963. Behavioral notes on a Floridian mantid, *Gonatista grisea* (F.) (Orthoptera, Mantidae). *Entomological News*, **74**(1): 1–2.
- La Greca, M.** 1939. Note su alcuni mantidi dell'Africa meridionale. *Bollettino dei Musei di Zoologia e Anatomia Comparata della R. Università di Genova*, **17**(112): 1–18.
- Lombardo, F. & Agabiti, B.** 2001. The mantids from Ecuador, with some biogeographic considerations. *Journal of Orthoptera Research*, **10**(1): 89–104.
- Maes, J.M. & Roy, R.** 2000. Orden Mantodea. Pp. 60–63 in Maes, J.M. (Ed.), *Insectos de Nicaragua*. Setab Bosawas, Marena, Managua.
- Marshall, J.A.** 1975. A catalogue of the primary types of Mantodea (Dictyoptera) in the British Museum (Natural History). *Bulletin of the British Museum (Natural History) Entomology*, **31**(8): 307–329.
- Medellín, C., Avendano, J. & Sarmiento, C.E.** 2007. Generos de Mantodea depositados en el Instituto de Ciencias Naturales de la Universidad Nacional de Colombia. *Boletín Científico – Centro de Museos - Museo de Historia Natural*, **11**: 148–159.

- Otte, D. 1978. The primary types of Orthoptera (Saltatoria, Mantodea, Phasmatodea and Blattodea) at the Academy of Natural Sciences of Philadelphia. *Proceedings of the Academy of Natural Sciences of Philadelphia*, **130**: 26–87.
- Otte, D. & Spearman, L. 2005. *Mantida species file. Catalog of the mantids of the world*. 489 pp. Association of Insect Diversity, Philadelphia.
- Passerin d'Entrèves, P. 1981. Cataloghi – collezioni ortotterologiche del Museo di Zoologia dell' Università di Torino. *Museo Regionale di Scienze Naturali*, **4**: 58–69.
- Piza, S. de Toldeo -JR. 1982. Um *Phyllovates* (Vatinae) e uma *Liturgusa* (Liturgusinae) novos do Brasil (Mantodea–Mantidae). *Revista de Agricultura*, **57**(3): 94.
- Rehn, J.A.G. 1903. A contribution to the knowledge of the Orthoptera of Mexico and Central America. *Transactions of the American Entomological Society*, **29**(1): 1–34.
- Rehn, J.A.G. 1935. The Orthoptera of Costa Rica. Part I. Mantidae. *Proceedings of the Academy of Natural Sciences of Philadelphia*, **87**: 167–271.
- Rehn, J.A.G. 1950. Three new Central-American Mantoidea – Orthoptera. *Transactions of the American Philosophical Society Philadelphia*, **76**: 363–383.
- Rehn, J.A.G. 1954. On some Gerstaecker types of Neotropical Orthoptera. I. Manteidae. *Transactions of the American Entomological Society*, **80**(3/4): 175–184.
- Roy, R. 1999. Morphology and taxonomy. Pp. 19–40 in Prete, F.R., Wells, H., Wells, P.H. & Hurd, L.E. (Eds.), *The praying mantids*. The Johns Hopkins University Press, Baltimore.
- Roy, R. & Cucho, T. 2008. Catalogue du matériel type des mantes conservé au Muséum d'histoire naturelle de Genève (Insecta: Mantodea). *Revue Suisse de Zoologie*, **115**(1): 3–24.
- Salazar E., J.A. 1998. Estudios sobre mantidos Colombianos (Mantodea). *Boletín Científico Museo de Historia Natural Universidad de Caldas*, **2**: 101–124.
- Salazar E., J.A. 1999. Celo Materno en *Stagmomantis theophila* Rehn, 1904 y un listado de las especies de Mantodea conocidas para Colombia. *Boletín Científico Museo de Historia Natural Universidad de Caldas*, **3**: 7–12.
- Salazar E., J.A. 2000. Mantidos contenidos en la colección entomológica 'FRANCISCO LUIS GALLEGÓ' Facultad de Agronomía Universidad Nacional, sede Medellín, Antioquía (Insecta: Mantodea). Part I. *Boletín Científico Museo de Historia Natural Universidad de Caldas*, **4**: 63–69.
- Salazar E., J.A. 2002. Lista de los Mantodea (Insecta) conocidos para Colombia. *Biota Colombiana*, **3**(1): 119–130.
- Salazar E., J.A. 2004. *Epaphrodita* Serville, 1831; *Stenophylla* Westwood, 1843 y *Acanthops* Serville, 1831, tres géneros de Mantidos hoja-seca de la Región Neotropical (Insecta, Mantodea). *Boletín Científico Museo de Historia Natural Universidad de Caldas*, **8**: 211–221.
- Saussure, H. 1869. Essai d'un système des Mantides. *Mittheilungen der Schweizerischen Entomologischen Gesellschaft*, **3**(2): 49–73.
- Saussure, H. & Zehntner, L. 1894. Pp. 123–197 in: *Biologia Centrali – Americana. Insecta – Orthoptera – Mantidae*, vol. 1. R.H. Porter, London.
- Schrader, F. & Hughes-Schrader, S. 1956. Polyploidy and fragmentation in the chromosomal evolution of various species of *Thyanta* (Hemiptera). *Chromosoma*, **7**: 469–496.
- Scudder, S.H. 1901. Alphabetical index to North American Orthoptera described in the eighteenth and nineteenth centuries. *Occasional Papers of the Boston Society of Natural History*, **6**: 1–436.
- Stål, C. 1877. Systema Mantodeorum. Essai d'une systematisation nouvelle des Mantodées. *Bihang till Kongl. Svenska Vetenskaps-akademiens Handlingar*, **4**(10): 1–91.
- Svenson, G.J. 2014. Revision of the neotropical bark mantis genus *Liturgusa* Saussure, 1869 (Insecta, Mantodea, Liturgusini). *Zookeys* (in press).
- Svenson, G.J. & Whiting, M.F. 2009. Reconstructing the origins of praying mantises (Dictyoptera, Mantodea): the roles of Gondwanan vicariance and morphological convergence. *Cladistics*, **25**(5): 468–514.
- Terra, P.S. 1995. Revisão sistemática dos gêneros de Louva-A-Deus da região neotropical (Mantodea). *Revista Brasileira de Zoologia*, **39**(1): 13–94.
- Tinkham, E.R. 1937. Studies in Chinese Mantidae (Orthoptera). *Lingnan Science Journal*, **16**(3): 481–499.

- Waterhouse, C.O.** 1902. *Index zoologicus*. 420 pp. Gurney & Jackson, London.
- Westwood, J.O.** 1889. *Revisio insectorum familiae Mantidarum, speciebus novis aut minus cognitis descriptis et delineatis*. 55 pp. Gurney & Jackson, London.
- Weidner, H.** 1964. Die Entomologische Sammlung des Zoologischen Staatsinstituts und Zoologischen Museums Hamburg. *Mitteilungen des Hamburgischen Zoologischen Instituts und Museums*, **61**: 123–144.
- Werner, F.** 1906. Zur Kenntnis afrikanischen Mantodeen. *Jahreshefte des Vereins für vaterländische Naturkunde in Württemberg*, **62**(34): 361–377.
- Werner, F.** 1908. Zur Kenntnis der afrikanischen Mantodeen. *Bericht der Senckenbergischen Naturforschenden Gesellschaft in Frankfurt am Main*, **39**: 31–56.
- Werner, F.** 1909. Bemerkungen über die geographische Verbreitung der Mantodeen (Fangheuschrecken). *Verhandlungen der Kaiserlich-Königlichen Zoologisch-Botanischen Gesellschaft in Wien*, **59**: 70–81.
- Werner, F.** 1916. Zur Kenntnis afrikanischer und indischer Mantodeen. *Verhandlungen der Kaiserlich-Königlichen Zoologisch-Botanischen Gesellschaft in Wien*, **66**: 254–296.
- White, M.J.D.** 1965. Sex chromosomes and meiotic mechanisms in some African and Australian mantids. *Chromosoma*, **16**: 521–547.
- Wieland, F.** 2008. The genus *Metallyticus* reviewed (Insecta: Mantodea). *Species, Phylogeny and Evolution*, **1**(2): 147–170.
- Wieland, F.** 2013. The phylogenetic systems of Mantodea (Insecta: Dictyoptera). *Species, Phylogeny and Evolution*, **3.1**: 3–222.
- Yager, D.D. & Svenson, G.J.** 2008. Patterns of praying mantis auditory system evolution based on morphological, molecular, neurophysiological, and behavioral data. *Biological Journal of the Linnean Society*, **94**: 541–568.